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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/915,963
Filing Date: July 26, 2001
Appellant(s): PETERSON, GEORGE EARL

Michael J. Urbano
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 15, 2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1, 3, 5-9, 11, 13, 15-18 and 10, 19, 21, 23-25 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

US H2016 H	Wicks et al.	4-2002
5,648,787	Ogot et al.	7-1997

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

I. Claims 2 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Despite applicant's disagreement, it remains the examiner's position that the limitation defining "the phase velocity being greater than the speed of light" still defies conventional theory of physics.

II. Claims 1, 3, 5-9, 11, 13 and 15-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Wicks et al. (US H2016 H).

Regarding claim 1, Wicks et al. teaches in figures 1-5 an antenna structure comprising: at least one antenna element [mono-blade antenna element], that at least one antenna element having at least one taper (See Figures 4-5); and a symmetrical finite ground plane [ground plane] coupled with the at least one antenna element [mono-blade antenna element].

Regarding claim 3, Wicks et al. teaches in figures 1-5 the antenna structure wherein the taper comprises an exponential profile.

Regarding claim 5, Wicks et al. teaches in figures 1-5 the antenna structure wherein the at least one antenna element [mono-blade antenna element] is positioned at an angle from the symmetrical ground plane [ground plane].

Regarding claim 6, Wicks et al. teaches in figures 1-5 the antenna structure wherein the angle is about 90 degrees with respect to the x-, y- and z-axes (See Figure 4).

Regarding claim 7, Wicks et al. teaches in figures 1-5 the antenna structure wherein the at least one antenna element [mono-blade antenna element] is coupled with the symmetrical ground plane [ground plane] by means of an unbalanced impedance [coaxial transmission line feed].

Regarding claim 8, Wicks et al. teaches in figures 1-5 the antenna structure wherein the unbalanced impedance [coaxial transmission line feed] comprises a coaxial cable.

Regarding claim 9, Wicks et al. teaches in figures 1-5 the antenna structure wherein a first conductor of the unbalanced impedance (See Figure 4) mechanically couples the at least one antenna element [mono-blade antenna element] with the symmetrical ground plane [ground plane].

Regarding claim 11, Wicks et al. teaches in figures 1-5 an antenna structure comprising: an array of at least two antenna elements (See Figure 5), each antenna element [mono-blade antenna element] having at least one taper; a symmetrical finite ground plane [ground plane]; and an unbalanced impedance [coaxial transmission line

feed] for coupling the array of at least two antenna elements with the symmetrical ground plane [ground plane] (See col. 4, lines 7-13).

Regarding claim 13, Wicks et al. teaches in figures 1-5 the antenna structure wherein the taper of at least on antenna element of the array comprises an exponential profile.

Regarding claim 15, Wicks et al. teaches in figures 1-5 the antenna structure wherein each antenna element [mono-blade antenna element] of the array is positioned at an angle from the symmetrical ground plane [ground plane].

Regarding claim 16, Wicks et al. teaches in figures 1-5 the antenna structure wherein the angle for each antenna element is about 90 degrees with respect to the x-, y- and z-axes (See Figure 4).

Regarding claim 17, Wicks et al. teaches in figures 1-5 the antenna structure wherein the unbalanced impedance [coaxial transmission line feed] comprises a coaxial cable.

Regarding claim 18, Wicks et al. teaches in figures 1-5 the antenna structure wherein a first conductor of the unbalanced impedance (See Figure 4) mechanically couples each antenna element of the array with the symmetrical ground plane [ground plane].

III. Claims 10, 19, 21 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wicks et al. (Cited above) in view of Ogot et al. (U.S. Patent No. 5,648,787).

Wicks et al. teaches every feature of the claimed invention in paragraph 4 except for the symmetrical disk shaped finite ground plane.

Ogot et al. teaches in figure 3A the symmetrical disk shaped finite ground plane [210, 250].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the metal ground plane as shown in Wicks et al. by using the symmetrical disk shaped finite ground plane as taught by Ogot et al. in order to maximize the surface area of the ground plane perpendicular to the transmission element, and provides a uniform transmission pattern (See col. 4, lines 66-67 and col. 5, lines 1-3).

(11) Response to Argument

I. ***Rejection of claims 2 and 12 under 35 U.S.C. 112***

Appellant alleges that First, the nonenablement rejection is fatally defective because it fails to provide Applicant with basic due process. The Examiner has not specified what conventional theory of physics he is relying on, and he has provided no scientific authority defining that theory and supporting his position. Second, the Examiner's cursory comments provide not even the slightest hint as to why he rejects the numerous authorities cited by Applicant in support of the fact that a phase velocity in excess of the speed of light is well known and does not violate any conventional theory of physics. Third, let us assume, arguendo, that the Examiner is relying on some notion that the speed of light (c) is the upper bound on the speed at which things (e.g., physical objects, electromagnetic waves) can travel through space. If so, the Examiner has

either misunderstood or misapplied basics physics principles as they relate to the phase velocity of an electromagnetic wave.

This argument is not deemed to be persuasive because First, there are two types of traveling wave antennas. A traveling wave with an angular frequency w and a phase constant β has a phase velocity $v=w/\beta$ and such a wave may be classified as either **fast or slow wave** depending on whether v is greater than or less than the velocity c (i.e. speed of light) of a plane wave **in free space**. Hence, a wave having $c/v \leq 1$ is referred to as a fast wave and a wave having $c/v \geq 1$ is referred to as a slow wave. Thus, the first class of antennas is referred to as fast wave antenna or more generally, a leak-wave antenna since continuously lose energy due to radiation, and the second type of antenna is the surface wave antenna (See column 6, lines 5-16 of US patent No. 4,931,808). Second, the materials or geometry which produces the recited phase velocity should be recited rather than the effect which is a phase velocity greater than the speed of light. Third, a traveling wave is "supporting" to perform a given function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense.

For the reasons set forth above, claim 2 and 12 need to meet two criteria one is **the traveling wave is the fast wave, and the other is in free space**. None of applicant's invention meets these two criteria.

II. ***Rejection of claims 1, 3, 5-9, 11, 13 and 15-18 under 35 U.S.C. 102(e)***

Regarding claims 1, 11 and 21:

Appellant alleges that Wicks et al. fails to teach a symmetrical finite ground plane as required by claim 1, lines 6-7. Independent claims 11 and 12 also require a symmetrical finite ground plane. More specifically, in Figures 1 and 2a of Wicks the one-dimensional ground plane is shown schematically as a horizontal line, which is a typical depiction of an infinite ground plane. On the other hand, in Figure 4 of Wicks the ground plane is depicted in three-dimensions as an irregular plate, with the cut-away view again suggesting an infinite ground plane.

This argument is not deemed to be persuasive because First, Wicks et al. teaches in figure 5 the ground plane as a finite ground plane, the other figures depicting this ground plane are showing it in abbreviated form for convenience only. Second, the ground plane extends to infinity, this makes the ground plane symmetrical since extending to infinity is a form of translational symmetry.

Regarding claim 3 and 13:

Appellant alleges that Wicks fails to teach or suggest that the curved segments of his antenna element are parabolic.

This argument is not deemed to be persuasive because from Webster's dictionary "parabola" means something bowl-shaped (as an antenna), curved segment B in figure 1-2 of Wicks is a parabolic profile.

III. ***Rejection of claims 10, 19, 21 and 23-25 under 35 U.S.C. 103(a)***

Regarding claims 10, 19, 21 and 23-25:

Appellant alleges that Wicks and Ogot teach away from one another and that one skilled in the art would not be motivated to substitute the Ogot narrow band circular disk ground plane for the Wicks broadband ground plane.

It would have been an obvious matter of design choice to have the symmetrical ground plane is disk shaped, since such a modification would have involved a mere change in the shape of the symmetrical ground plane. A change in shape is generally recognized as being within the level ordinary skill in the art (See MPEP 2144.04 IV B).

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,
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Primary Examiner
Art Unit 2821

SXC
July 28, 2004

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